

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. **(Previously amended)** A variable capacitor circuit to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time; comprising:

a set of individual small capacitors;

a set of capacitor switching stages, each stage comprising:

a switching device allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching device is connected in series with one of said small capacitors;

a switch control circuit to control the switching operation of said switching device in a steady ramp-up/ramp-down manner by generating a controlling signal, directly depending on a tuning voltage input, one for each of said capacitor switching stages;

a threshold circuit to generate a set of threshold values, one for each of said capacitor switching stages; and

a circuit to provide said tuning voltage, dedicated for the voltage controlled capacitance change.

2. **(Currently amended)** The circuit of claim 01 wherein said capacitors are discrete capacitor components.
3. **(Currently amended)** The circuit of claim 01 wherein said capacitors are manufactured on planar carrier.
4. **(Currently amended)** The circuit of claim 01 wherein said capacitors are integrated on a semiconductor substrate, but on a separate substrate than said capacitor switching stages.
5. **(Currently amended)** The circuit of claim 01 wherein said capacitors are integrated on a semiconductor substrate and on the same substrate as said capacitor switching stages.
6. **(Currently amended)** The circuit of claim 01 wherein said capacitors are manufactured as a Metal-Oxide structure.
7. **(Currently amended)** The circuit of claim 01 wherein said capacitors are manufactured as a junction capacitor.
8. **(Currently amended)** The circuit of claim 01 wherein said switching device is a transistor.

9. **(Previously amended)** The circuit of claim 8 wherein said switching device is a P-channel or N-channel junction FET.

10. **(Previously amended)** The circuit of claim 8 wherein said switching device is a PMOS or NMOS FET.

11. **(Currently amended)** The circuit of claim 01 wherein said switch control circuits are connected directly to said tuning voltage circuits.

12. **(Currently amended)** The circuit of claim 01 wherein said switch control circuit uses a voltage follower circuit, which receives its input from said tuning voltage circuit.

13. **(Currently amended)** The circuit of claim 01 wherein said set of tuning voltage circuits, one for each of said capacitor switching stages, is implemented as a chain of resistors.

14. **(Previously amended)** A variable capacitor circuit to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time; comprising:

a set of individual small capacitors;

a set of capacitor switching stages; each stage comprising:

a switching device to allowing a steady ramp-up/ramp-down phase between the points of being fully switched on and fully switched off, and where said switching devices are connected in series with, one of said small capacitors;

a switch control circuit to control the switching operation of said switching device in a steady ramp-up/ramp-down manner by generating a controlling signal, directly depending on a tuning voltage input; said switch control circuit comprising:

an amplifier to produce a linear control signal for said steady ramp-up/ramp-down switching operation;

a set of threshold circuits to generate a set of threshold values, one for each of said amplifier stages; and

a circuit to provide said tuning voltage, dedicated for the voltage controlled capacitance change, for all of said amplifier stages.

15. **(Original)** The circuit of claim 14 wherein said amplifier is an operational amplifier.

16. **(Canceled)**

17. **(Previously amended)** The circuit of claim 14 wherein said set of threshold circuits to generate a set of threshold values, one for each of said capacitor switching stages, is implemented as a chain of resistors.

18. **(Previously amended)** The circuit of claim 14 wherein said circuit to provide a tuning voltage, dedicated for the voltage controlled capacitance change, is a single signal connected to all tuning inputs of said capacitor switching stages .

19. **(Previously amended)** A method to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time generate; comprising:

providing a set of individual small capacitors, a set of capacitor switching stages, comprising a switching device to connect said capacitors in parallel, a switch control circuit to linearly control the switching operation of said switching device, a set of threshold circuits to generate a set of threshold values, one for each of said capacitor switching stages, and a circuit to provide said tuning voltage, dedicated for the voltage controlled capacitance change, for all of said capacitor switching stages;

switching on or off one of said switching devices in order to connect one of said small capacitors in parallel to the other capacitors, that are already connected in parallel, connecting in parallel one capacitor after the other;

controlling the switching operation in a steady ramp-up/ramp-down manner for each of said switching devices, in order to partially switch on said small capacitors;

generating a set of controlling signals, directly depending on the tuning voltage input, to produce linear control signals for said steady ramp-up/ramp-down switching operation;

generating a set of threshold values, one for each of said capacitor switching stages; and

supplying said tuning voltage, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages.

20. **(Canceled)**

21. **(Canceled)**

22. **(Canceled)**

23. **(Canceled)**

24. **(Canceled)**

25. **(Canceled)**

26. **(Canceled)**

27. **(Currently amended)** The method of claim **1929** wherein generating a set of threshold values, one for each of said capacitor switching stages uses a chain of resistors.

28. **(Currently amended)** The method of claim ~~1929~~ wherein supplying a tuning voltage, dedicated for the voltage controlled capacitance change, to all of said capacitor switching stages uses a single signal, connected to all tuning inputs of said capacitor switching stages.

29. **(Previously amended)** A method to control the capacitance of a variable capacitor in a linear mode through a tuning voltage and to achieve a high Q-factor at the same time generate; comprising:

providing a set of individual small capacitors, a set of capacitor switching stages, comprising a switching device to connect said capacitors in parallel, a switch control circuit to linearly control the switching operation of said switching device, each of said switch control circuits comprising an amplifier to produce a linear control signal for said switching operation, a set of threshold circuits to generate a set of threshold values, one for each of said capacitor switching stages, and a circuit to provide said tuning voltage, dedicated for the voltage controlled capacitance change, for all of said capacitor switching stages;

switching on or off one of said switching devices in order to connect one of said small capacitors in parallel to the other capacitors, that are already connected in parallel, connecting in parallel one capacitor after the other;

controlling the switching operation in a steady ramp-up/ramp-down manner for each of said switching devices, in order to partially switch on said small capacitors;

comparing the difference of the capacitance tuning voltage and the threshold voltage of each capacitor switching stage to produce the linear control signal for said steady ramp-up/ramp-down switching operation;

generating a set of threshold values, one for each of said capacitor switching stages; and

supplying a tuning voltage, dedicated for the voltage controlled capacitance change, for all of said capacitor switching stages.

30. **(Previously amended)** The method of claim 29 wherein comparing the difference of the capacitance tuning voltage and the threshold voltage of each capacitor switching stage to produce the linear control signal for said continually switching operation is performed by an operational amplifier.